U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

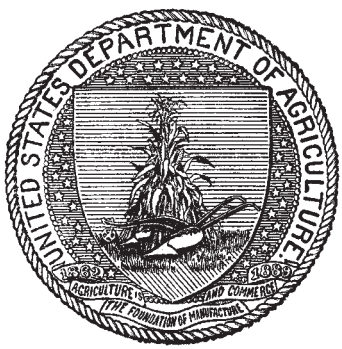
COOPERATING WITH THE MISSISSIPPI AGRICULTURAL EXPERIMENT STATION.
W. L. HUTCHINSON, DIRECTOR.

SOIL SURVEY OF THE McNEILL AREA, MISSISSIPPI.

BY

WILLIAM G. SMITH AND WILLIAM T. CARTER, JR.

[Advance Sheets—Field Operations of the Bureau of Soils, 1903.]



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[PUBLIC RESOLUTION—No. 9.]

JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided*, That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the Congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized into the Bureau of Soils.]

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MAP.

Soil map, McNeill sheet, Mississippi.

SOIL SURVEY OF THE M'NEILL AREA, MISSISSIPPI.

By WILLIAM G. SMITH and WILLIAM T. CARTER, Jr.

LOCATION AND BOUNDARIES OF THE AREA.

The McNeill area lies, in nearly equal parts, in the counties of Pearl River and Hancock. It is comprised within the limits of townships 4 and 5 south of St. Stephens base and ranges 16 and 17 west from St. Stephens meridian and range 14 east from the Washington meridian. The area covers about 198 square miles and is rectangular in shape, being 12 miles north and south and about 16 miles east and west. Pearl River forms the western boundary of the area. The area is only about 20 miles from the Gulf of Mexico and lies within the Lafayette formation of the Coastal Plain.

The larger part of the road map was prepared by the Mississippi Experiment Station. This was extended somewhat by plane-table traversing by the soil party. Original land survey maps were relied on to some extent in making up the final base.

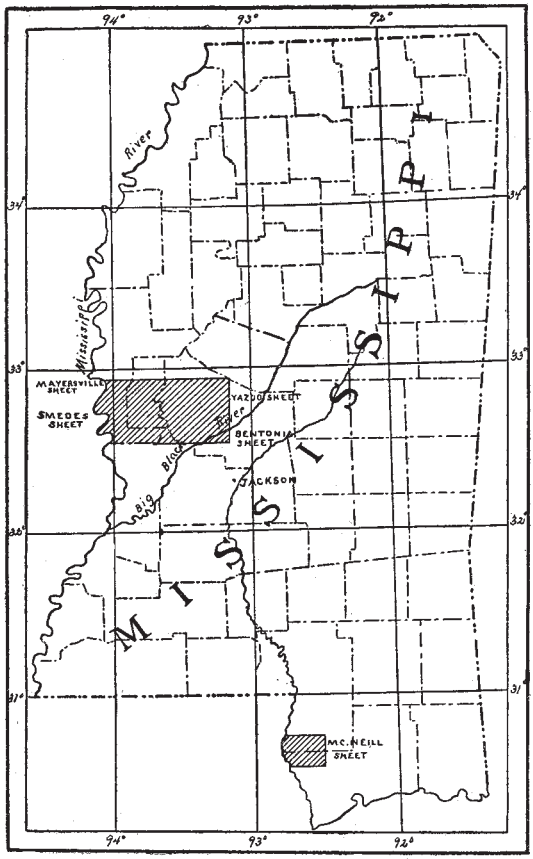

FIG. 1.—Sketch map showing position of the McNeill area, Mississippi.

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

The McNeill area, considered in an agricultural sense, is quite young, though in a historical sense it is quite as old as some of the more thickly settled parts of the State. Hancock County was formed in

1812 and at that time included what is now Pearl River County, the latter having been organized only since 1890. About 1871 the New Orleans and Northeastern Railroad was built through this county, and the lumbering industry of the area began to assume greater importance and value. Stumpage that then could be bought for $5 an acre now brings $12 to $18. Since 1890 the population has about doubled, but is now approximately only 6 per square mile. About one-third of the population is colored. The oldest families are largely of English descent. Quite a number of people have recently come in from North Carolina and other Southern States.

Lumbering and turpentine production are at present the most important industries of the area, but as these pass away a decided development of the agricultural industries must take place.

CLIMATE.

Climatological data applying directly to the area were not obtainable. The records of the Weather Bureau stations at Pearlington, Miss., and Amite, La., are used and serve fairly well to indicate the climatic conditions of the area.

Normal monthly and annual temperature and precipitation.

Month.	Pearlington.		Amite.		Month.	Pearlington.		Amite.	
	Temperature.	Precipitation.	Temperature.	Precipitation.		Temperature.	Precipitation.	Temperature.	Precipitation.
	°F.	Inches.	°F.	Inches.		°F.	Inches.	°F.	Inches.
January	52.4	4.32	51.7	6.01	August	80.2	7.00	80.8	4.71
February	55.5	5.66	53.6	6.06	September	77.3	5.64	77.2	3.69
March	61.9	5.66	61.6	5.36	October	67.7	2.78	66.9	2.00
April	66.4	4.83	67.8	5.01	November	59.5	2.55	58.7	4.15
May	74.4	2.68	74.2	3.42	December	53.3	3.67	52.1	4.16
June	79.6	6.34	79.6	6.37	Year	67.4	57.91	67.1	57.86
July	80.9	6.78	81.4	6.92					

The area lies within the warm temperate zone. The proximity of the Gulf of Mexico doubtless exerts some influence on the temperature and rainfall. The annual temperature is about 67° F. In summer the temperature ranges from 95° to over 100°, and by reason of the high humidity becomes quite oppressive. The winter temperature seldom drops to the freezing point and usually is much above, the average for January being about 50°. June, July, and August are the hottest months, the average temperature being something over 80°.

The normal annual rainfall is about 58 inches, which is so distributed that a serious drought is seldom experienced.

The average date of the last killing frost in spring at Pearlington is March 6, and the first in autumn at Poplarville is November 27. At Hattiesburg, a Weather Bureau station to the north in Perry County, the last in spring is March 6, and first in fall is November 28. Such

freezes as may occur in winter harden the ground to a depth of an inch or so for a day or two only. There is scarcely any time during the winter that plowing and similar work can not be readily carried on, especially on the upland areas. The mild winters are an advantage in stock raising, and permit the growing of several crops on the same land during the same year.

PHYSIOGRAPHY AND GEOLOGY.

The McNeill area lies from about 60 to 300 feet above sea level, and has a gradual slope southward. The surface of the land when raised above the Gulf waters was probably a quite uniform plain. In this the streams have carved out channels from 10 to 200 or more feet deep, and this has resulted in the formation of two quite distinct physiographic divisions—the uplands and bottom lands. The uplands have a gently rolling surface, with occasional extensive, flat interstream areas. The bottom lands consist of the alluvial deposits along the streams, the widest areas being found along the Pearl River. Here the bluff of the upland rises quite abruptly 100 to 200 feet above the river bottoms. The line of this bluff is very broken and hilly in places, especially in the northern part of the area, while southward, where its level approaches that of the Pearl River, it is not so much broken. The other main drainageways, Abolo Chitto and Little Abolo Chitto creeks, have relatively narrow bottoms and the escarpments are less abrupt. The area is thus divided into three sections by the three main streams running nearly north and south. The numerous smaller streams leading into these afford excellent drainage for the area.

The upland portion of the McNeill area is formed of that subdivision of the Pleistocene period termed the Lafayette, while the stream bottom material belongs to the most recent subdivision of that period, or the Alluvium. The upland consists of a bed of red and yellow sandy clay from 10 to 40 feet thick, underlain by gray and yellow mottled clay containing varying amounts of silt and fine sand and, occasionally, small white gravel. This clay material is usually very wet and plastic, and evidently quite impervious to water. The red and yellow sandy clay, on the other hand, seems quite pervious. The sandy clay has the physical property of retaining its form as a vertical wall in a road cut or in a well. Curbing in wells extends down only 2 or 3 feet, below this the walls consisting of the bare surface of the clay. Wells are usually dug as deep as the gray impervious clay, where abundant and usually very good drinking water is found. No artesian wells were found in the area, but a good flowing well was seen at Pickayune, and it is believed that flowing wells might be secured.

Occasionally sandstone ledges are found in the sandy clay stratum, formed evidently by the cementing of the material itself by filtrating

iron salts. Small traces of gravel are also to be found, and in a few cases quite extensive gravel deposits were noticed.

The alluvium of the larger streams seems to be frequently underlain by a sandy stratum. This would indicate a period in the history of the streams when the volume of water discharged was greater and its movement more rapid than at present.

SOILS.

Three of the soils of the area are derived from the upland section, and three from the alluvial portion of the area. The following table shows the extent of each of these types:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Norfolk fine sandy loam	81,472	64.3	Meadow	6,976	5.5
Gadsden loam	14,592	11.5	Portsmouth loam	3,328	2.6
Neuse clay	13,120	10.3	Total	126,784	
Orangeburg sandy loam	7,296	5.8			

ORANGEBURG SANDY LOAM.

The Orangeburg sandy loam consists of 4 to 10 inches of a dark reddish gray sandy loam, underlain usually by a red sandy clay. The type occurs as a broken band of rather small, irregular areas in the longleaf pine uplands, extending in a northeast-southwest direction through the area surveyed. As a rule, the texture is quite uniform, being that of a sandy loam in which there is a considerable admixture of clay, although there is some local variation, and occasionally a quite deep, loose, gray, sandy soil is found, usually on a slope or divide where the rain waters could wash the clay out of the soil without replacing it with wash from some higher slope.

The surface of the Orangeburg sandy loam is that of a gently rolling upland with occasional flat areas. The type usually has good natural drainage, owing to its fairly open texture and rolling surface. Some of the flat areas are not naturally well drained, but this condition can in most cases be remedied by a few open ditches leading to some one of the many natural drainage ways.

This soil owes its origin to the weathering of the red sandy clay constituting the Lafayette formation of the Gulf Coastal Plain. This material, when first raised above the Gulf waters, probably presented a much less sandy surface than now. The action of rain waters has doubtless removed a considerable part of the clay, leaving behind the sand. This action not being uniform over all of the area doubtless accounts, in part at least, for some of the local variations in the texture of this type.

The Orangeburg sandy loam is much preferred to those types with a yellow or light-colored subsoil. The red clay seems to possess a natural productiveness superior to clays of any other color. The farmers in the McNeill area recognize this fact, and therefore the upland soils with a reddish clay subsoil are the first to be brought under cultivation. Water seeps but slowly through the red sandy clay, and the effects of fertilizers are lasting.

Cotton, corn, sugar cane, and forage crops, as well as such truck crops as sweet potatoes, Irish potatoes, turnips, and strawberries, are successfully produced on this soil. Cotton yields from one-half to three-fourths of a bale per acre, corn from 20 to 30 bushels, sugar cane from 250 to 300 gallons of sirup per acre, and sweet and Irish potatoes from 150 to 300 bushels per acre.

The Orangeburg sandy loam is well adapted to the crops just enumerated. It is quite certain that the staple crops do well, and judging from the results obtained in a small way in kitchen gardens, the other crops mentioned might be depended on to do well in a larger way.

A large proportion of the type is still forested with longleaf pine, but as the lumbering and turpentine interests pass away more of this type will come under cultivation.

The following table of mechanical analyses shows the texture of the Orangeburg sandy loam:

Mechanical analyses of Orangeburg sandy loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8016	¾ mile S. of McNeill.	Gray sandy loam, 0 to 8 inches.	4.00	0.48	8.56	14.52	22.00	5.40	39.08	9.26
8018	1½ miles E. of Lacey.	Gray sandy loam, 0 to 8 inches.	2.56	.44	5.46	11.56	22.30	6.74	36.62	16.88
8017	Subsoil of 8016.	Red sandy clay, 8 to 36 inches.	.32	.24	6.80	13.44	23.86	5.34	25.52	24.22
8019	Subsoil of 8018.	Red sandy clay, 8 to 36 inches.	.56	.24	3.72	8.86	17.86	5.46	37.38	27.36

NORFOLK FINE SANDY LOAM.

The Norfolk fine sandy loam consists of 8 to 12 inches of gray sandy loam underlain by a yellow sandy clay subsoil. The type is quite extensively and uniformly distributed throughout the area surveyed, representing about 65 per cent of the total area.

Like the Orangeburg sandy loam, the Norfolk fine sandy loam is characterized by a gently rolling surface quite well dissected by many small streams. Occasionally extensive flat interstream areas are met with,

and in general the southern part of the area has a flatter surface than the northern part.

By reason of its gently rolling surface and fairly open texture the natural drainage of this soil is good, though not excessive. Such flat areas as need artificial drainage can usually be drained at small cost by means of open ditches leading to some natural drainage way. The subsoil of this type, like that of the Orangeburg sandy loam, has a texture which does not allow the clay readily to slide into and fill up a ditch, and open ditches are therefore quite serviceable and enduring.

The Norfolk fine sandy loam doubtless originated from weathering of the yellow sandy clays of the Lafayette formation. These yellow sandy clays have been subjected to a washing process identical with that previously described in the case of the red clays, resulting in the residual accumulation of the sandy loam surface. As in the case of the Orangeburg sandy loam, this action has not been uniform, which accounts for such variations in texture as occur. On some of the slopes and better-drained areas a rather deep, open-textured soil was found. This phase, however, was not found to such an extent as to make it seem advisable to map it as a separate type. In the southern part of the area, however, some of the flat and relatively poorly drained areas of this type presented a texture quite heavy, and the more pronounced phases of this character were mapped as another type (Portsmouth loam).

The soils derived from the yellow clays are not as fertile as those derived from the red clays, though fair crops are grown on them. The texture of this type is such as allows only a slow seepage of water, and it therefore holds fertilizers quite well, and can be brought to a good state of productiveness where proper cultural methods are employed.

Cotton, corn, cane, and forage crops are grown successfully on this soil. The yield of cotton is about one-half bale per acre, with possibilities of greater yields where proper crop rotation and fertilizing are practiced. Corn yields from 15 to 25 bushels per acre. The yields of many of the truck crops, such as sweet and Irish potatoes, turnips, pease, beans, strawberries, and raspberries, grown in kitchen gardens, indicate that these crops might prove profitable if grown on a commercial scale.

The crops just mentioned are well adapted to the Norfolk fine sandy loam. Judging from some peach trees seen in the area, it would seem as if the peach industry might safely be extended on this type. The pecan nut industry also gives promise of success here. At present the greater part of the area of this type is covered with a growth of longleaf pine.

The following table of mechanical analyses shows the texture of this soil:

Mechanical analyses of Norfolk fine sandy loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8014	¾ mile E. of Lacey.	Gray sandy loam, 0 to 8 inches.	2.97	0.96	6.00	11.54	25.22	11.34	38.98	5.20
8012	3 miles S. of Lacey.	Gray sandy loam, 0 to 12 inches.	1.98	.46	2.32	8.38	30.68	10.54	36.40	10.34
8015	Subsoil of 8014....	Yellow sandy clay, 8 to 36 inches.	.76	.58	4.38	9.40	23.02	8.46	37.24	16.88
8013	Subsoil of 8012....	Yellow sandy clay, 12 to 36 inches.	.42	.36	1.60	7.20	26.10	8.90	36.04	19.68

PORTSMOUTH LOAM.

The Portsmouth loam consists of from 4 to 8 inches of dark-gray sandy and silty loam, underlain to a depth of from 18 to 24 inches by a rather plastic sandy clay, which in turn usually grades into a mottled gray and yellow clay containing some sand. Some phases of the type are locally termed "savanna." Such areas support a scattering growth of pine and a thick stand of sedge grass. Other phases have a good stand of merchantable pine. The type is found only in the southern part of the present survey in relatively small areas.

The Portsmouth loam has quite a flat surface. It occurs as the lower levels of the upland. The elevation above the sea is about 70 feet, while most of the other upland soils lie at an elevation of from 100 to 300 feet. By reason of its relatively low-lying position and flat surface this type possesses very poor drainage. During wet weather, and especially during the winter season, it is very wet and in places even boggy. Most of it, however, admits of fair drainage by means of open ditches. Tile drains could be used to advantage in connection with the open ditches.

The texture admits a fairly free movement of water, though not so free as in the sandier and higher lying types previously described. From its flat surface, low-lying position, and pronounced clay and silt content it is presumed that this type retains much of the physical characteristics of the material when first raised above the Gulf waters. The action of rain waters in removing the clay from the upper surface layer could not operate here as it did in the higher levels, and thus little change in the texture of this soil has taken place. Indeed, in some instances an addition of clay instead of a removal may have been effected.

The type is fairly rich in organic matter. Owing to its position it

has been enriched by wash from the higher levels, and by reason of the slow drainage much of this fertility has been retained. Scarcely any of this soil is as yet under cultivation, but when drained and properly cultivated it will doubtless be found very productive of such crops as cotton, corn, sugar cane, and forage plants. It also has possibilities for growing vegetables and small fruits. All the areas of this soil support a fair growth of grass, and are well adapted for grazing nearly the year around.

The following table of mechanical analyses shows the texture of samples of this type:

Mechanical analyses of Portsmouth loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8024	7 miles W. of Richardson.	Fine sandy loam, 0 to 8 inches.	3.96	0.50	1.00	1.80	10.90	16.50	58.20	11.00
8022	3¼ miles W. of Richardson.	Gray sandy loam, 0 to 12 inches.	2.65	.00	.26	.32	14.72	24.52	43.50	16.76
8025	Subsoil of 8024....	Silty clay, 8 to 36 inches.	.49	.20	.46	1.24	9.54	13.06	55.24	20.10
8023	Subsoil of 8022....	Yellow sandy clay, 12 to 36 inches.	.51	.18	.20	.66	18.44	19.52	38.98	21.92

MEADOW.

The Meadow type of this area consists of 4 to 8 inches of dark sandy loam, underlain by an ashy-gray plastic sandy clay, 3 to 10 or more feet in depth. The type occurs as narrow bottom lands along the smaller streams of the upland. Its surface is usually quite flat and the soil is inclined to be wet. The areas range from one-sixteenth to one-fourth mile in width, and lie from 10 to 40 feet lower than the general level of the upland. Parts of the type could be drained by open ditches, leaving the soil sufficiently dry for cultivation during the growing season. The principal feature of such drainage would be the opening up and deepening of the present stream channels, into which a few laterals could lead.

The Meadow owes its origin largely to deposition of sediment from flood waters. Much of this material has been carried from the upper courses of the streams, but by reason of the narrowness of the bottoms a great deal of soil has been washed down from the adjoining uplands. The variation in texture is not so great as in the majority of areas surveyed, and the type is uniformly wet and boggy. Along the larger streams a different condition obtains, and in the position normally occupied by Meadow is found another type—the Gadsden loam.

By reason of its manner of formation the Meadow possesses considerable natural fertility. The top soil is well charged with decayed vegetable matter, and when drained the type becomes one of the most productive in the area. Very little of it is as yet under cultivation, most of it being covered with a growth of bay trees and an undergrowth of cane and shrubbery. Considerable grass is found in the more open parts, which, with the wild cane and shrubbery, furnishes abundant feed for stock almost the entire year.

That part of the Meadow admitting of artificial drainage is very valuable for growing sugar cane. It is believed that rice could also be profitably grown. All of the Meadow areas could be greatly improved as a forest and stock range reserve by the use of proper forestry methods. As the demand for cultivable land becomes greater some utilization of these bottom lands along the lines mentioned may be looked for.

GADSDEN LOAM.

The Gadsden loam consists of 8 to 18 inches of dark, yellowish-gray, rather fine sandy loam, underlain by a yellowish-gray fine sandy or silty loam somewhat heavier in texture. This soil, locally called "hammock land," occurs as moderately high bottoms along the Abolo Chitto and Little Abolo Chitto creeks, and is also found skirting the foot of the bluffs that face the Pearl River.

The Gadsden loam is elevated from 3 to 10 feet above the normal height of the streams. It is often found lying in knolls and ridges, between which a heavier textured material is found. Along the Abolo Chitto Creek it varies from one-fourth mile to about 1½ miles in width. The part next the stream may be slightly higher than that lying between the stream banks and the upland. In such cases many basin-like depressions, crooked, bayoulike drainage channels, and areas of flat, boggy land are characteristic surface features. These mark the type, to a certain extent, along the foot of the Pearl River bluffs. Here, however, there is usually a gradual slope from the bluff toward the river until the type merges into the flat lands or "swamp" of the lower bottom.

Owing to its relatively elevated position the type is seldom subject to overflow. Its surface affords ready drainage for the rain waters and only occasionally is artificial drainage necessary.

The Gadsden loam is derived from stream-deposited sediments intermixed with material washed from the upland areas. It does not now seem, however, that this process of formation is continuing. The greater part of these "hammock" lands seems to have been formed at a time when the floods were much higher and the currents much swifter than they are now. The extensive stratum of white sand occasionally seen underlying the type to a depth of from 3 to 6 or more feet would seem to support this theory.

These lands were among the first to be cultivated, being cleared from fifty to seventy-five years ago. Experience has shown them to be quite productive. The soil contains considerable organic matter, as shown by the mechanical analyses, and, judging from the crop yields, a fair amount of mineral plant food in available form.

Cotton, corn, and forage crops are successfully grown on the Gadsden loam. The yields of cotton range from one-half to three-fourths bale per acre, and of corn from 20 to 35 bushels per acre. This soil is very well adapted to the staple crops. Certain of the small fruit and truck crops, as well as tree fruits, could doubtless also be grown on this type. At present not much of it is cleared and tilled, being largely covered with a mixed growth of hardwood and scattering pine, with an undergrowth of shrubbery, vines, and wild cane. It affords an excellent range for cattle. Many fields cultivated before the civil war are now in young forest.

The following table of mechanical analyses shows the texture of samples of this type:

Mechanical analyses of Gadsden loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8026	5 miles S. of Chinquapin.	Dark sandy loam, 0 to 6 inches.	2.41	0.58	8.22	16.48	19.76	6.22	26.56	21.32
8027	Subsoil of 8026....	Yellow sandy clay, 6 to 36 inches.	.54	.46	6.26	13.06	14.96	5.26	28.38	31.76

NEUSE CLAY.

The Neuse clay consists of 4 to 8 inches of dark-gray, silty loam, underlain by a mottled gray and yellow silty clay to a depth of from 3 to 6 feet or more. This type occurs as the lower bottom along the Pearl River, in a continuous area ranging in width from less than a mile to over 3 miles.

The surface is flat and lies from about 4 to 12 feet above the normal height of the river. It is subject to overflow. Many small ponds, crooked streams, and bayous, and even quite large streams, cut the area. The most notable of these is Old River, which is fully half the size of Pearl River.

The texture of this type is such as to admit of quite ready passage of seepage water. In addition to this there occurs at a depth of 3 feet or more a sandy stratum into which many of the smaller streams have cut. By reason of the ready movement of water through this sandy substratum, all the streams rise or fall in unison. This, of course,

favors rapid and complete drainage when the main streams are normal or low; but on the other hand, as these fill up the whole flood plain rapidly becomes wet and boggy and the lower levels are covered with a foot or more of standing water. Under such conditions as these levees would be ineffective in preventing flooding, even if the comparatively limited extent of the type would justify the cost of a levee system.

Upon drying the soil becomes hard and refractory, large, deep cracks forming throughout its surface. As might be inferred, the type is more subject to drought when the streams fall and a continued dry spell sets in than even the piney woods upland.

The Neuse clay consists of sediments deposited from the successive inundations of the Pearl River. The texture of this material is quite uniformly a silty clay loam. There are, however, variations in texture due to the action of the minor streams, as well as that of the Pearl River itself. Adjacent to the streams the texture is often lighter, and in some few instances limited areas of a sandy phase may be found. The soil contains a fair amount of decayed vegetable matter deposited by flood waters, as well as from the growth and decay of plants on the soil. The productiveness of the type is undoubted, the difficulty of drainage being the main obstacle to its cultivation. Scarcely any of the type is at present under cultivation within the limits of the area surveyed. Before the civil war a part of it was under cultivation and good crops of cotton and corn were secured. These fields have since grown up in hardwood forest of white oak, ash, gum, cottonwood, and willow, with an undergrowth of coarse grass, cane, and shrubbery.

On account of frequent overflows and the difficulty and cost of leveeing, the Neuse clay will doubtless continue to be used chiefly as a stock range. It is believed that planting and properly caring for forest trees, especially poplar, would prove profitable. There is a heavy commercial demand for poplar, which grows rapidly in low, wet situations, and the cost of planting and trimming the trees is not large.

The following table of mechanical analyses shows the texture of samples of this soil:

Mechanical analyses of Neuse clay.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8020	4 miles SW. of Chinquapin.	Gray silty clay loam, 0 to 10 inches.	1.79	0.00	0.60	0.64	5.96	24.84	34.14	34.10
8021	Subsoil of 8020.....	Silty clay, 10 to 36 inches.	.36	.00	.54	.30	4.84	29.74	39.46	25.28

AGRICULTURAL CONDITIONS.

Agriculturally the area as a whole is undeveloped. The leading industries at present are lumbering, turpentine distilling, and charcoal burning. A few plantations were opened up from fifty to seventy-five years ago on some parts of the "hammock" lands of the Pearl River and Little and Big Abolo Chitto creeks, and on the adjoining piney woods upland, but it is only within the past fifteen or twenty years that new farms have been put under cultivation. These as yet are few and scattering and are modest in their equipment.

The white inhabitants are fairly well off. A few rent, but more own the land they cultivate, and some of them have large lumbering interests besides. The more thrifty and industrious negroes also own some property. They live fairly well, the lumbering industry in addition to agriculture affording ready and abundant opportunity for work the year around. A few are renters of land, while a very few are owners of the land they till.

About 2 per cent of the area is under cultivation, though for the counties as a whole the proportion is about 9 per cent. Most of the farms are worked by the owner of the land, there being only a few tenant farmers. Rentals range from $3 to $5 per acre on a cash basis, and from one-fifth to one-fourth of the crop on a share basis. The manager class is not represented here, there being no very large plantations. The credit system, resulting in liens against the crop, is practiced here, as in so many other places in the South. The typical plantation store, however, is not seen here. The merchants are located in the small towns, usually on or near the railroad, and do a large amount of profitable credit business. It would be much better for the community if the farmers would produce more of the necessaries of life and do their trading on a cash basis.

The average size of farms in Hancock and Pearl River counties is, respectively, 143 and 167 acres. These figures doubtless represent very nearly the general size of farms in the area surveyed. There are a few holdings of 1,000 or 2,000 acres in the hands of lumbermen, but these are being sold to smaller holders as the lumber is removed. Considerable land recently available for homesteading has been taken up in tracts of 160 acres. Land with the timber on it brings from $15 to $25 an acre, while after the merchantable timber is removed the price ranges from $2 to $6 an acre.

The labor situation, from the farmer's standpoint, is not very satisfactory. Labor is not very plentiful nor efficient. The lumbering concerns can afford to pay higher wages than can the farmers, and thus absorb much of the available labor. Most of the farmers with small holdings do their own work, with the assistance of their

families. A few of them seem fully alive to the advantage of employing labor-saving machinery.

The lumber and charcoal industries are rapidly consuming the timber of the area. If the cut-over land is placed under cultivation it costs from $6 to $18 per acre to remove the stumps and rubbish. The land can be quickly cleared by blowing the stumps out with dynamite and burning them, but this is an expensive method as compared with that of converting much of this material into marketable charcoal. It is said that the returns from the charcoal will pay the total cost of clearing the land ready for the plow.

The production of crops in the area is not great. Some cotton is grown and there are two gins in the area. Some corn and vegetables are grown, but cotton, as elsewhere in the State, is the money crop.

Quite a number of cattle, sheep, and hogs, and some goats are raised. These usually graze on the free range the year round, and therefore cost their owners little or nothing for food and shelter.

In the discussion of the soil types mention has been made of the crop adaptability of each type, but a brief recapitulation will be made here in order to emphasize the agricultural industries that may be profitably developed in the area.

The Orangeburg sandy loam is regarded as the strongest of the upland soils. The staple crops—cotton, corn, and forage crops—all do well. The effect of fertilizer is lasting and crops respond readily when good cultural methods are employed. The sandier phase of the type has marked possibilities for peaches and plums, as well as for pecan nuts. Strawberries, small fruits, and many of the truck crops, such as sweet and Irish potatoes, and the root crops, such as turnips and rutabagas, do well and their cultivation might be extended with profit.

The Norfolk fine sandy loam is not considered quite as productive as the Orangeburg sandy loam, but where additional care in cultivation is practiced the crops noted for the Orangeburg sandy loam will do well on the Norfolk fine sandy loam. The staple crops, truck crops, and small fruits require more fertilizer to do as well, while for peaches, plums, and pecans, the conditions for success are about the same. Some attempts at growing pears have not proved successful. The blight destroys the trees, and at present the growing of this fruit on a commercial scale should not be attempted.

The Portsmouth loam needs considerable artificial drainage, but when this is secured it is very productive of the staple crops. Forage crops could be grown in abundance, and the live-stock industry could be extended.

The Meadow type at present can not be regarded as having any agricultural value. The type serves, however, as an excellent range for cattle throughout the year. Portions of the Meadow will doubtless have considerable value for the growing of sugar cane and rice when

the agriculture of the area reaches the stage where artificial drainage will pay.

The Gadsden loam has qualities suited for the production of the staple crops, as well as some of the truck and fruit crops. Not much of the type is cleared as yet. In its present state it is valued as a stock range. The clearing of this type for the growing of cotton, corn, and vegetables may be looked for as the agriculture of the area becomes more extended.

The Neuse clay is at present most valued as a cattle range and a source of supply for some kinds of timber. It seems as if some practical forest culture might be carried on here with profit. The willow grows abundantly and might be grown for basket making and other purposes. On account of its liability to overflow, the type will probably never have much value for growing field crops.

The transportation facilities of the area are quite good. The New Orleans and Northeastern Railroad passes through its center, connecting with New Orleans, which is only about 60 miles distant. The wagon roads are not numerous nor are they improved to any great extent, but those on the uplands are remarkably good throughout the year. Those of the bottom land and low, wet, flat lands are, of course, quite boggy during the winter and after heavy rains.

The principal market for the area is New Orleans. To this city goes much of the charcoal, cotton, sweet potatoes, Irish potatoes, turnips and rutabagas, peas, beans, and such peaches and pecans as are now produced for market. A marked development of the trucking industry along the line of the railway may be looked for in the near future. As larger quantities of these crops are produced better facilities for shipping can be provided by the railroad. Strawberries could probably be shipped as early fruit to Northern markets with greater profit than could be realized in New Orleans. Poultry and dairy products could doubtless be profitably sent either south or north. On the whole, the outlook for the development of the agriculture of the McNeill area is very favorable

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U.S. DEPT OF AGRICULTURE
BUREAU OF SOILS
MILTON WHITNEY, CHIEF

SOIL MAP
MISSISSIPPI
Mc NEILL SHEET

MISSISSIPPI AGRICULTURAL
EXPERIMENT STATION
W.L. HUTCHINSON DIRECTOR

SOIL PROFILE
(3 feet deep)

Orangeburg sandy loam — Ssc / C|S
Norfolk fine sandy loam — Ssc / C|S
Portsmouth loam — Ssc / C|S / C
Gadsden loam — Ssc / Ssc
Neuse clay — Sic / Si|C
Meadow — Ssc / C

LEGEND
Ssc Sandy loam
C|S Sandy clay
C Clay
Sic Silt loam
Si|C Silty clay

R. 18 W. | R. 17 W. | R. 16 W.
T. 4 S. | T. 5 S.

Pools Bluff
Chinquapin
Caledonia Station
Millard
Sones Chapel
Mc Clures Switch
Mc NEILL
Tates Switch
Carriere Station
Lacey
Pine Grove Station
Caesar
Walkiah
Richardson

Old River
Gum Bayou
Cypress Bayou
Pearl River
Long Creek
Foc Creek
Chilto Creek
Abolo Creek
Eastern R.R.
North & East & New Orleans R.R.

PEARL RIVER CO.
HANCOCK CO.
BOUNDARY LINE
LOUISIANA

LEGEND
OI Orangeburg sandy loam
Ns Norfolk fine sandy loam
PI Portsmouth loam
GI Gadsden loam
Nc Neuse clay
M Meadow

Soils surveyed by
Wm. G. Smith and Wm. T. Carter Jr.
1903.

BASE MAP PREPARED BY MISSISSIPPI AGRICULTURAL EXPERIMENT STATION.

Scale 1 inch = 1 mile

A. Hoen & Co. Lith. Baltimore, Md.

Field Operations
Bureau of Soils
1903.